

IN THE CLAIMS:

This listing of claims will replace all prior versions, and listings, of claims in the application:

1. (Currently Amended) A data processing apparatus for processing data read out from an information storage medium,
data to be recorded on the information storage medium for respective recording units being a data block with sync codes,
the data block being a block generated by inserting sync codes at predetermined intervals for sector data,
the sector data being generated from some data of the data block with error correction codes,
the data block containing data in row and column directions,
~~one data sequence containing at least two sync frames a first sync frame and a second sync frame;~~
~~one sync frame containing a sync code and some data of the sector data,~~
~~the first sync frame containing a first sync code and some data of the sector data,~~
~~the second sync frame containing a second sync code and some data of the sector data,~~
a demodulated data sequence obtained by removing the first and second sync codes from one data sequence being data that contains the error correction codes, and error correction being able to be attained for each demodulated data sequence,
the data processing apparatus comprising:
a demodulation unit configured to output the demodulated data sequence on the basis of data in the information storage medium and output address information corresponding to the demodulated data sequence; and
a syndrome calculation unit configured to calculate a syndrome of the demodulated data sequence containing a first demodulated data sequence and a second demodulated data sequence, and
~~the syndrome calculation unit including a calculation unit configured to make a calculation required to realize syndrome calculation of demodulated data for each sync frame obtained by excluding one sync frame~~

wherein the syndrome calculation unit enables a syndrome calculation of the demodulated data sequence by detecting a data loss in the first sync frame and the second sync frame on the basis of the address information, performing switching on the basis of the detection of the first demodulated data sequence corresponding to the first sync frame, calculating a first syndrome of the first demodulated data sequence by a first calculation, performing switching on the basis of the detection of the second demodulated data sequence corresponding to the second sync frame, calculating a second syndrome of the second demodulated data sequence by a second calculation, setting the first syndrome as binary 0 on the basis of a loss detection of the first demodulated data sequence, setting the second syndrome as binary 0 on the basis of a loss detection of the second demodulated data sequence, and outputting the syndrome of the demodulated data sequence on the basis of the first syndrome and the second syndrome.

2. (Original) An apparatus according to claim 1, further comprising:
a storage unit configured to store the demodulated data sequence; and
an error correction unit configured to detect and correct any errors contained in the demodulated data sequence stored in the storage unit,
wherein the syndrome calculation unit calculates the syndrome of the demodulated data sequence in parallel with the storage process of the demodulated data sequence by the storage unit.

3. (Currently Amended) An apparatus according to claim [[1]] 2, further comprising:
a calculation result storage unit configured to store the syndrome calculation result calculated by the syndrome calculation unit; and
a management unit configured to manage a read-out state of data from the information storage medium for respective sync frames,
~~wherein the syndrome calculation unit calculates the syndrome of the demodulated data sequence on the basis of the read-out state of data managed by the management unit.~~
wherein the syndrome calculation unit recalculates the syndrome of the demodulated data sequence by detecting a change in order in which the first and second sync frames arrive on the basis of the read-out state of data managed by the management unit, and reading out the syndrome stored in the calculation result storage unit.

4. (Original) An apparatus according to claim 3, wherein the error correction unit detects and corrects any errors on the basis of the syndrome calculation result stored in the calculation result storage unit, and the read-out state of data managed by the management unit.

5. (Currently Amended) A data processing method for processing data read out from an information storage medium,

data to be recorded on the information storage medium for respective recording units being a data block with sync codes,

the data block being a block generated by inserting sync codes at predetermined intervals for sector data,

the sector data being generated from some data of the data block with error correction codes,

the data block containing data in row and column directions,

one data sequence containing ~~at least two sync frames~~ a first sync frame and a second sync frame;

~~one sync frame containing a sync code and some data of the sector data,~~

the first sync frame containing a first sync code and some data of the sector data,

the second sync frame containing a second sync code and some data of the sector data,

a demodulated data sequence obtained by removing the sync codes from one data sequence being data that contains the error correction codes, and error correction being able to be attained for each demodulated data sequence,

the data processing method comprising:

outputting the demodulated data sequence on the basis of data in the information storage medium, and outputting address information corresponding to the demodulated data sequence;

~~making a calculation required to realize a syndrome calculation of demodulated data for each sync frame obtained by excluding one sync frame upon calculating a syndrome of the demodulated data sequence.~~

executing a syndrome calculation of the demodulated data sequence containing a first demodulated data sequence and a second demodulated data sequence by detecting a data loss in the first sync frame and the second sync frame on the basis of the address information,

performing switching on the basis of the detection of the first demodulated data sequence corresponding to the first sync frame, calculating a first syndrome of the first demodulated data sequence by a first calculation, performing switching on the basis of the detection of the second demodulated data sequence corresponding to the second sync frame, calculating a second syndrome of the second demodulated data sequence by a second calculation, setting the first syndrome as binary 0 on the basis of a loss detection of the first demodulated data sequence, setting the second syndrome as binary 0 on the basis of a loss detection of the second demodulated data sequence, and outputting the syndrome of the demodulated data sequence on the basis of the first syndrome and the second syndrome.

6. (Original) A method according to claim 5, further comprising:

calculating, when the demodulated data sequence is stored and any errors contained in the demodulated data sequence are to be detected and corrected, the syndrome of the demodulated data sequence in parallel with the storage process of the demodulated data sequence.

7. (Currently Amended) A method according to claim [[5]] 6, further comprising:

~~managing a read-out state of data from the information storage medium for respective sync frames, and calculating the syndrome of the demodulated data sequence on the basis of the managed read-out state of data.~~

storing the syndrome calculation result, managing a read-out state of data from the information storage medium for respective first and second sync frames, reading out the stored syndrome calculation result by detecting a change in order in which the first and second sync frames arrive on the basis of the managed read-out state of data by the management unit, and recalculating the syndrome of the demodulated data sequence.

8. (Original) A method according to claim 7, wherein the calculated syndrome calculation result is stored, and any errors are detected and corrected on the basis of the stored syndrome calculation result and the managed read-out state of data.